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The possible existence of an $H\beta$ radiation, as reported by Mr. CAMPBELL for October 20th, may prove of interest in connection with the suggested canal-ray Doppler-Fizeau effect.

As stated in our former paper on the spectrum, we incline to the view that the lines are observed nearly in their normal positions, and that the double lines are possibly the edges of flutings in bands not yet observed and identified in the laboratory. In this connection we should not overlook the faint lines at $\lambda 453$ - and $\lambda 423$ -, which may be the edges of other and fainter flutings in the same bands. Attention should be called to the strong line at $\lambda 3913$, which is not doubled. It seems to stand alone in this regard.

If we take either the more refrangible or the less refrangible component of each of the four pairs of lines between $\lambda 4002$ and $\lambda 4715$ and form the successive differences in the wavelengths, we find that the second differences are constant within the errors of observation. This may indicate, as the source of these radiations, a substance or compound closely related to carbon.

Inasmuch as an identity has been shown to exist between certain comets and meteor streams, and laboratory analyses have shown meteorites to differ widely in chemical composition, it would not seem surprising that there should be different types of comet spectra.

It is hoped that PLUVINEL and DESLANDRES have been able to obtain observations additional to those already published which shall test thoroughly the various explanations suggested. Dr. CURTIS, in charge of the D. O. Mills Observatory at Santiago, Chile, has been asked to secure an extensive series of spectrograms with a one-prism slit spectrograph and with an improvised objective-prism spectrograph during the several months that the comet will be favorably situated for observers in the southern hemisphere.

W. W. CAMPBELL,
SEBASTIAN ALBRECHT.

January, 1909.

THE BRIGHTNESS OF THE CORONA OF JANUARY 3, 1908.

The attempt by the writer to determine the total brightness (photographic) of the corona of August 30, 1905, was not successful, owing to the thin clouds. Two negatives, together

with some exposures on the preceding full Moon, were secured. These have little value, however, except to confirm the conclusion, reached from the 1908 eclipse, that most of the light of the corona emanates from within one minute of the Sun.

The attempt was repeated at the eclipse of January 3, 1908, when entirely successful observations were obtained. The details of these observations and a discussion of them will be published as a *Lick Observatory Bulletin*. Only the results will be given here.

The effect of the coronal light was obtained by allowing it to shine through an aperture on a sensitive plate, without the intervention of any optical parts whatever. On these same plates were impressed standard intensity squares for comparison.

From these negatives were obtained:—

1. The total actinic brightness of the corona.
2. The actinic brightness of the sky surrounding the Sun.
3. The limits from within which practically all of the effective light of the corona emanates.

It was found that nearly all of the effective light of the corona came from a ring around the Sun not over 1' wide. Outside that limited region the light of the corona, although visible to the eye conspicuously, was not strong enough in comparison to be distinguishable.

The light from the above narrow region was found to equal 6.0 lamp units. The light from the full Moon, at its mean distance, was found to be 55.6 lamp units. The region of the corona observed gave, therefore, 0.108 as much light as the full Moon. This amount should be increased by the fainter parts of the corona, the brightness of which has not yet been determined.

The average intrinsic brightness of the narrow region of the corona observed was found to be 2.07 lamp units; that of the Moon, 2.65 lamp units. As the brightest parts of the narrow coronal ring are easily two, or possibly three, times the *average* brightness, the brightest parts of the corona are, therefore, brighter intrinsically than the full Moon.

This result accords with the naked-eye view of the corona, which shows a very brilliant and very narrow ring of light immediately surrounding the dark body of the Moon.

The light of the sky around the bright corona, from an area of 40,900 square minutes, was found to equal 3.0 lamp units. This gives an *average* intrinsic actinic brilliancy of .0026 as compared with the lamp, or of .001 as compared with the surface of the full Moon.

The intrinsic brilliancy of the region of corona observed is found to be eight hundred times that of the surrounding sky.

C. D. PERRINE.

MT. HAMILTON, CAL., January 27, 1909.

RESULTS OF FURTHER STUDIES ON THE STRUCTURE OF PHOTOGRAPHIC FILMS.

In a previous paper I gave the conclusion that the principal cause of the large discordances in measures of star photographs was to be found in the size and irregular arrangement of the silver grains composing the star image. Further investigations were undertaken to eliminate some of the trouble from these sources.

The details of the recent investigations will appear in a *Lick Observatory Bulletin*, and only the general results will be given here.

It was found that the accuracy was materially increased by giving sufficient exposure to insure light action entirely through the film, and full but slow development to give greater uniformity to the grain.

Rapid plates with an increased proportion of silver yield more accordant measures than plates with the normal amount of silver.

Where the structure is sufficiently uniform, as in Seed 23, and Transparency plates, it was found possible, by observing the above requirements, to produce negatives such that the range among the measures is only twice the uncertainty of the measures themselves.

Thin films appear to give much more reliable results than thick ones.

C. D. PERRINE.

MT. HAMILTON, CAL., January 22, 1909.